

# Letter 1



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street

San Francisco, CA 94105-3901

BATTLE MOUNTAIN FIELD OFFICE

MAY 04 2001

OFFICE OF THE  
REGIONAL ADMINISTRATOR

Gerald Smith, Field Manager  
Battle Mountain Field Office  
Bureau of Land Management  
50 Bastian Road  
Battle Mountain, NV 89820

Dear Mr. Smith:

The U.S. Environmental Protection Agency (EPA) has reviewed the **Phoenix Mine Project Draft Environmental Impact Statement (DEIS), Lander County, NV [CEQ #010054]**. Our review and comments are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementation Regulations at 40 CFR 1500-1508, and Section 309 of the Clean Air Act.

Battle Mountain Gold Company (BMG) has proposed the Phoenix Mine Project, an expansion of BMG's current mining and mineral processing operations in Copper Canyon near Battle Mountain, Nevada. The project would involve developing two new open pits, expanding two existing pits, processing previously mined stockpiled gold ore, and expanding/constructing heap leach, milling, waste rock, and tailings facilities. The project, which would disturb 4,295 acres of public and private lands, includes backfilling of three existing open pits. The proposed project would recover approximately 5.2 million ounces of gold, 27 million ounces of silver, and 360 million pounds of copper over a period of 28 years.

Groundwater quality has been affected by past mining activities in the project area, and groundwater currently exceeds maximum contaminant levels (MCLs) for several parameters, including arsenic, cadmium, copper, nickel, zinc, selenium, mercury, beryllium, chloride, and low pH. Waste rock and tailings from the project are anticipated to generate leachate which will result in further degradation of groundwater. This leachate may also contaminate downstream surface waters. In addition, metals in the capping material used to reclaim waste rock and tailings could pose risks to soil invertebrates and other wildlife and inhibit plant growth and reclamation success. Furthermore, groundwater drawdown from the project could reduce flows and/or dry up the lower perennial reach of Willow Creek and ten other springs, potentially affecting trout and springsnail populations. Given the very clear evidence that this mining project would create a perpetual and significant acid mine drainage problem, EPA believes a much more detailed discussion is necessary in order to determine the magnitude and certainty of the mitigation measures.

1-1

# Responses to Letter 1

1-1 The Phoenix Project Draft Environmental Impact Statement (EIS) concludes that long-term impacts associated with waste rock facilities could occur to ground water quality. The Bureau of Land Management's (BLM's) regulations for Surface Management (43 Code of Federal Regulations [CFR] §3809.552(c)) give the BLM the option, with the applicant's agreement, to fund for the long-term potential impacts of the proposed project. Battle Mountain Gold (BMG) agreed to develop and, if necessary, implement a Long-term Groundwater Management Plan with the appropriate funding instrument. Contrary to the commenter's suggestion, BMG will be required to provide appropriate funding instruments prior to project startup to ensure that adequate funds are available for long-term implementation of the plan. Mitigation measure WR-5 (Section 3.2.4) addresses the need for additional long-term water quality monitoring to supplement the project's Contingent Long-term Groundwater Management Plan (Brown and Caldwell 2000c). The plan is based on the hydraulic control of the affected ground water and the capture of solutes as close as possible to the source. Ground water extraction wells, a proven technology, would be located at interceptor points downgradient of each waste rock facility. The captured water would then be treated prior to disposal, in accordance with federal and state requirements.

The Council on Environmental Quality regulations for implementing the National Environmental Policy Act (NEPA) (40 CFR §1500 - 1508) and the BLM's NEPA guidelines require the analysis of all potentially affected resources and disclosure of the identified impacts. Bonding for plans of operations is strictly a requirement of 43 CFR §3809; the inclusion of detailed bonding and cost information in an EIS is not a NEPA requirement. Detailed reclamation bonding information is included in the Phoenix Project Plan of Operations (Brown and Caldwell 2000h), and detailed long-term bonding information is included in the Phoenix Project Long-term Contingency Fund (Battle Mountain Gold Company 2001). Nevertheless, the BLM has included in Sections 2.4.21 and 2.4.22 of the Final EIS additional general information regarding the existence of financial assurances for reclamation and the contingency fund. However, the addition of the general bonding information and the absence of detailed cost information in the EIS does not result in "substantial changes in the proposed action that are relevant to environmental concerns; or significant new circumstances or information relevant to the environmental concerns and bearing on the proposed action or its impacts" (40 CFR §1502.9). The BLM also does not consider the lack of detailed bonding information renders the Draft EIS "so inadequate as to preclude meaningful analysis..." (40 CFR §1502.9). Therefore, preparing a revised or supplemental Draft EIS is considered unwarranted and unnecessary.

## Letter 1 Continued

2

According to the DEIS, contaminated leachate exceeding MCLs is anticipated to be generated by site facilities for thousands of years. BMG proposes to monitor surface runoff, the vadose zone, and groundwater beneath and downgradient of site facilities, and implement perpetual extraction and treatment of groundwater under its "Contingent Long-Term Groundwater Management Plan." There is no assurance, however, that this would occur.

As our staff discussed with Jon Sherve on April 24, 2001, EPA has rated this DEIS as 3 -- **Inadequate Information** (see enclosed "Summary of Rating Definitions and Follow-Up Action"). The DEIS includes neither an itemized cost estimate for closing and perpetually operating and maintaining the site, nor an adequate guarantee that a financial instrument will exist to ensure funds would be available in perpetuity to prevent degradation of water quality and impacts to biological resources. In the absence of such a guarantee, EPA considers this project unacceptable because unmitigated exceedence of drinking water standards on a long-term basis would constitute a significant environmental impact.

We believe that the failure of the DEIS to require that BMG post financial assurances to ensure compliance with environmental standards results in an inadequate discussion under NEPA of the measures to mitigate adverse environmental effects of the project. We do not intend to suggest that such detailed information on these issues is always necessary for an EIS for a mine project; however, in this case we believe that the information is required for several reasons, including the severity, magnitude, geographic scope and duration of the environmental problems the project would create, and because the viability of the mine closure and post closure is such a critical factor in whether this project may be considered acceptable. Furthermore, EPA believes this information is significant and essential for an adequate analysis of the proposed project because it could make the difference between a project that is sufficiently managed over the long-term by the site operator or an unfunded or under funded contaminated site that becomes a liability for the Federal or State government and taxpayers under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Therefore, we have rated this DEIS as **inadequate**. We believe the additional information identified in this letter and attached comments is of such a magnitude that it should have full public review as a DEIS. As we previously discussed, we therefore urge the Bureau of Land Management (BLM) to prepare a revised or supplemental draft environmental impact statement to address the inadequacies identified in this letter and attached comments, or substantially change the proposed project. If these inadequacies are not adequately addressed in the Final Environmental Impact Statement (FEIS), or the proposed project is not substantially changed to reduce potential environmental impacts, this project may be referred to the President's Council on Environmental Quality (CEQ) in accordance with 40 CFR Part 1504.

We appreciate the opportunity to review this DEIS. As was discussed by our respective staff, we want to work with you as you complete the process as required by NEPA and its implementing regulations. If you have any questions, please call me at (415) 744-1002, or have your staff contact Lisa Hanf, Federal Activities Office Manager at (415) 744-1584 or Jeanne

1-1

## Responses to Letter 1

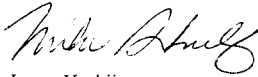
## Letter 1 Continued


3

1-1

Geselbracht, our lead NEPA reviewer for this project, at (415) 744-1576. Please send three copies of the revised or supplemental EIS to this office (mailcode CMD-2) at the same time it is filed with our Washington, D.C. office.

Sincerely,



 Laura Yoshii  
Acting Regional Administrator

002424

Enclosures

cc: Allen Biaggi, Nevada Division of Environmental Protection  
Stanley Wiemeyer, U.S. Fish and Wildlife Service, Reno  
Anne Miller, EPA Office of Federal Activities, Washington, D.C.  
Al Trippel, Newmont Mining Corporation  
Bernice Lalo, Battle Mountain Band of Te-Moak Tribe of Western Shoshone  
Tom Leshendok, BLM, Reno  
John Mudge, Newmont Mining Corporation

## Responses to Letter 1

# Letter 1 Continued

Phoenix Mine DEIS  
EPA Comments – May, 2001

## General Comments

1-2 According to the DEIS, the Proposed Action is expected to result in significant degradation of groundwater and possibly surface water, and pose ecological risks to wildlife and vegetation on the reclaimed surface. Among other things, the proposed project would contaminate groundwater and possibly surface water through the perpetual generation of acid mine drainage. In addition, it appears from the DEIS that the capping/growth medium material in the project vicinity may be unsatisfactory for successful reclamation and may pose unacceptable ecological risks. Based on available information, the proposed project would require perpetual treatment. The DEIS recognizes the need for closure and post-closure activities, but does not contain information that allows for an evaluation of whether adequate resources would be allocated to assure proper closure and perpetual treatment. In the absence of adequate information and commitments on closure and post-closure, the project would have significant adverse environmental impacts.

## Closure and Post-Closure Costs and Financial Assurance

1-3 According to the DEIS, baseline groundwater quality has been affected by past mining activities in the project area, and groundwater currently exceeds maximum contaminants levels (MCLs) for several parameters, including arsenic, cadmium, copper, nickel, zinc, selenium, mercury, beryllium, chloride, and low pH. The Proposed Action is predicted to result in further degradation of groundwater, including exceedences of MCLs for numerous parameters, including low pH, sulfate, and several metals. Given the very clear evidence that this mining project would create a perpetual and significant acid mine drainage problem, and based on the uncertainties regarding implementation and success of proposed mitigation, EPA believes a much more detailed discussion is necessary in order to determine the magnitude and certainty of the mitigation measures. While we acknowledge that there is some variability in future closure or post closure costs, it is possible to understand the magnitude of the problem through experience at other sites with acid mine drainage problems. Our comments are based on EPA's experience at these other mine sites.

The revised or supplemental DEIS should provide (1) clarification of who would be responsible for all phases of closure and post-closure monitoring and implementation of perpetual treatment systems, (2) a thorough itemization and discussion of anticipated closure and post-closure costs, and (3) an adequate guarantee that a financial instrument would exist to ensure funds in perpetuity to monitor for and prevent degradation of groundwater and impacts to biological resources. In the absence of such information and a guarantee that the mitigation would occur, EPA considers this project unacceptable because unmitigated exceedences of drinking water standards on a long-term basis would constitute a significant environmental impact.

# Responses to Letter 1

1-2 At the BLM's request and in accordance with 43 CFR §3809.552(c), BMG developed the Contingent Long-term Groundwater Management Plan (Brown and Caldwell 2000c) and the associated Phoenix Project Long-term Contingency Fund (Battle Mountain Gold Company 2001). Potentially significant impacts to ground water and surface water resources associated with the Phoenix Project facilities would be avoided and mitigated with proven technology identified in this ground water management plan, and the associated long-term funding would ensure that financial resources are available for implementation of that plan. Please also see the response to comment 1-1.

1-3 The BLM has reviewed and approved the technical adequacy of the Contingent Long-term Groundwater Management Plan (Brown and Caldwell 2000c) and the associated financial assurance package, in compliance with the BLM's bonding policy. The U.S. Environmental Protection Agency (USEPA) and the public may review this financial information in the Phoenix Project Plan of Operations and all associated documents. Specifically, the Reclamation Plan (Section 6 of the Plan of Operations) and the Phoenix Project Long-term Contingency Fund (Battle Mountain Gold 2001) discuss funding for reclamation and closure and postclosure monitoring and mitigation at the site. As the operator, BMG would be legally responsible for closure and for postclosure monitoring and mitigation. However, the required surety would ensure that adequate funding is available for a third party to implement these measures in the event BMG is unable to do so. Please also see the responses to comments 1-1 and 1-2.

# Letter 1 Continued

Phoenix Mine DEIS  
EPA Comments – May, 2001

1-3 Furthermore, EPA believes this information is significant and essential for an adequate analysis of the proposed project because it could make the difference between a project that is sufficiently managed over the long-term by the site operator or an unfunded or under funded contaminated site that becomes a liability for the Federal or State government and taxpayers under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or similar authorities. In light of the recent history of mine bankruptcies in Nevada and throughout the western United States, it is imperative that the DEIS discuss how Battle Mountain Gold (BMG)/Newmont Mining Corporation (Newmont) would finance the closure and post-closure activities at this mine. The fact that the proposed mining activities are expected to span several decades also highlights the importance of securing a highly reliable closure mechanism at the inception of the project.

## Responsible Parties

1-4 The DEIS includes BMG's "Contingent Long-Term Groundwater Management Plan" for monitoring surface runoff, the vadose zone, and groundwater beneath and downgradient of site facilities and, if necessary, construction and implementation of a perpetual extraction and treatment system. The DEIS (p. 3.2-87) states that the "Contingent Long-term Groundwater Management Plan is designed to prevent degradation of ground water quality in the postclosure period." According to the DEIS (p. 3.2-86), however, the time frame for continued monitoring of the waste rock facilities during post-closure is not specified. The DEIS (p. 3.2-87) also states, "In addition to the monitoring measures set forth in the Contingent Long-term Groundwater Management Plan, the BLM, in coordination with applicable state agencies, *may* require BMG to provide funding for additional monitoring of ground water in the postmining period" [emphasis added]. The DEIS does not state that BLM would definitely require BMG to fund for monitoring in the postmining period (i.e., after closure activities are completed); or that BMG funding would be required for perpetual treatment, which is certain to be needed. In fact, the DEIS (p. 3.2-88) states that the long-term monitoring information would be used by *BLM and other applicable state agencies* to implement the groundwater extraction and treatment system, as necessary. It is unclear, therefore, exactly who would be responsible for perpetual monitoring and implementation of perpetual treatment systems. The revised or supplemental DEIS should identify who would be responsible for all phases of closure and post-closure monitoring and implementation of perpetual treatment systems for 1000+ years.

## Cost Estimate

1-5 In order to provide adequate information to decisionmakers and the public, the revised or supplemental DEIS should include an itemized cost estimate for closure and reclamation activities, as well as post-closure activities and contingencies. Elements of closure and post-closure that would be appropriate to evaluate and discuss in the DEIS include the costs of all

# Responses to Letter 1

1-4 It is the responsibility of the BLM to protect the long-term condition of public lands. Final closure of a mining operation does not occur until the operator has met all regulatory obligations; if monitoring detects ground water degradation, then the operator is financially responsible for containing and treating the affected water prior to final closure. The BLM's regulations for Surface Management [43 CFR §3809.552 (c)] state that the BLM can require an operator to fund for monitoring in the postmining period; the Phoenix Project Long-term Contingency Fund (Battle Mountain Gold 2001) would provide this funding. The wording in mitigation measure WR-5 (Section 3.2.4) in the Final EIS has been revised to indicate the BLM would require BMG to provide the required funding. Please also see the response to comment 1-2.

1-5 As indicated in the responses to comments 1-1 and 1-2, general information has been provided in Sections 2.4.21 and 2.4.22 of the Final EIS relative to the financial assurances for both life-of-mine reclamation and the Long-term Groundwater Management Plan. Cost estimates for the reclamation financial assurance have been determined based on the BLM's hiring of a third-party contractor to perform the required work. There are nine detailed categories associated with the cost estimates; these include: (1) earthwork and recontouring; (2) revegetation and stabilization; (3) detoxification, water treatment, and disposal of waters; (4) structure, equipment, and facility removal; (5) a contingency for project uncertainties and unexpected natural events; (6) insurance for on-site liability; (7) bond for performance and payment; (8) profit for federal construction contracts; and (9) contract administration.

Nevada BLM policy requires that any approved plans of operations, in compliance with §3809, have an adequate financial guarantee. All documents associated with determining financial assurances are public information and can be reviewed at the appropriate BLM field office.

# Letter 1 Continued

Phoenix Mine DEIS  
EPA Comments – May, 2001

1-5

reclamation activities, adequate cap/growth medium material, closure-phase fluid management, constructing extraction wells, a treatment plant and appropriate collection facilities, reinjection wells and water conveyances, operating the treatment plant in perpetuity, monitoring and reporting, capital equipment replacement, rebuilding the facilities on some regular interval such as every 30 years, and project management costs. Such costs will include: direct materials (chemicals, electrical power and other utilities, etc.); supplies (office, oil/gasoline, etc.); equipment replacements (rusted-out pumps, pick-up trucks, etc.); purchased services (office equipment maintenance contracts, consultants, etc.); staffing (direct operating labor, direct maintenance labor, operations supervision, maintenance supervision, on a 24-hour day, 365-day year); payroll burden and fringe benefits for the work force; maintenance materials and supplies; indirect costs (purchasing, receiving, sludge transport, sludge disposal, safety training, first aid, accounting, clerical, security, mobile and special equipment, small tools, yard and building maintenance, property taxes, insurance, etc.); general and administrative costs (administrative staff, travel, public relations, training and meetings, office rental, communications and postage, office equipment, supplies and maintenance, office equipment rentals, professional services -- engineering, legal, environmental, geochemical, employee recreation, health, data processing); and other costs (state taxes, fees, etc.).

The cost estimate should also include a meaningful contingency amount (such as 50-100 percent) for uncertainties such as underestimated groundwater pumping rates or utility rates, the need for additional wells, and other unanticipated circumstances. All future costs need to be increased based on a compound inflation rate.

## Financial Assurance

1-6

EPA believes that the Proposed Action is unacceptable without a BLM commitment to complete a legally enforceable agreement with BMG/Newmont *prior* to approving a Plan of Operations (POO), which would ensure funding for all components of the reclamation, closure, and post-closure activities at any time during and after project operations. The revised or supplemental DEIS should include a specific commitment by BLM to secure this legal agreement before issuing a POO and identify elements of the agreement that would be required in order to ensure its adequacy and enforceability over time. The legally enforceable agreement should include:

- the cost estimates for reclamation and closure, as well as perpetual post-closure treatment and care as discussed above;
- a financial guarantee in the form of a government bond or other similar instrument that guarantees the cost of closure (with an adequate contingency) at all times as deemed necessary by BLM or the State of Nevada in a manner that ensures appropriate measures are taken to prevent degradation of water quality and adverse impacts to biological resources;

# Responses to Letter 1

1-6

The Proposed Action for the EIS is the Phoenix Project Plan of Operations submitted in accordance with 43 CFR §3809.1-4 and §3809.1-5. A complete plan of operations includes a reclamation plan with a supporting cost estimate. The Phoenix Project Plan of Operations was originally submitted in August 1994. It has been revised numerous times with the most recent submittal occurring in September 2000. The Phoenix Project Plan of Operations has been analyzed under 43 CFR §3809, effective November 26, 1980, with the exception of the bonding requirements, which are being analyzed under revised 43 CFR §3809, effective January 20, 2001 (revised 43 CFR §3809.400).

Two bond cost estimates have been developed for this project. The revised regulations provide for a life-of-mine reclamation bond and, if determined necessary by the BLM, a long-term postclosure financial instrument. The life-of-mine reclamation bond is legally binding and ensures that the operator pays or performs in accordance with the reclamation plan. This bond has been estimated based on the Nevada BLM Bonding Process for Plans of Operations Authorized by 43 CFR §3809/3802.

The BLM has determined that the Phoenix Project has the potential for long-term water quality impacts. In accordance with 43 CFR §3809.552 (c), the BLM has requested that BMG establish a bond and trust fund to ensure the continuation of long-term treatment. The funding mechanism and cost estimate is presented in the Phoenix Project Long-term Contingency Fund (Battle Mountain Gold Company 2001) and will be implemented at the time of project development. This is a detailed proposal itemizing costs associated with the implementation of the Contingent Long-term Groundwater Management Plan (Brown and Caldwell 2000c), which describes the monitoring, capture, and treatment method of any water affected by the Phoenix Project facilities, beginning 60 years after the start of mining. Both documents are part of the Phoenix Project Plan of Operations and will be legally binding on BMG in the event the Plan of Operations is approved.

The BLM considers preparing a revised or supplemental Draft EIS unwarranted and unnecessary.



# Letter 1 Continued

Phoenix Mine DEIS  
EPA Comments – May, 2001

- the specific terms of the financial assurance mechanisms to provide such funds, including how they adjust with costs over time;
- the terms specifying which bonds are releasable to BMG/Newmont upon completion of closure activities and which are to be held by BLM in perpetuity;
- the parties responsible for decisionmaking and monitoring, construction, operations, and maintenance;
- a provision to reevaluate costs and financial assurances every five years over the project life and a commitment by BMG/Newmont to increase financial assurances as necessary.

In year 2001 dollars, the cost of closing the mine at year 10 may actually be higher than closing the mine at year 30 because of the time value of money (assuming that the bond grows at a rate that is higher than inflation). To assure that funds are available to close the mine at all times, it is therefore not appropriate to only evaluate the cost of closure in 30 years. The DEIS should therefore evaluate the cost of closing the mine at various intervals (such as every 5 years) over the life of the project using realistically conservative assumptions and assuming that a third party government contractor is performing the closure and post-closure activities. The analysis should also account for the different groundwater drawdown contours associated with different project termination dates. For example, if the project closed *X* years early, how would the following be affected: (1) groundwater drawdown contours; (2) timing and extent of groundwater rebound; (3) timing and extent of groundwater contamination; (4) timing, configuration and cost of extraction and treatment facilities; and (5) cost of treatment. Sensitivity analysis of these factors, as well as assumptions regarding inflation and bonding rates, will provide important information regarding the robustness of the analysis.

The BLM may wish to consider alternative financial assurance mechanisms for the long-term funding in light of the long-term nature of some of the post-closure needs. Regardless of the mechanism that is utilized, funding must be available for unanticipated contingencies at any time during the post-closure phase.

## Alternatives Analysis

The DEIS only evaluates two alternatives – the Proposed Action and No Action. Pursuant to 40 CFR 1502.14, the EIS should rigorously explore and objectively evaluate all reasonable alternatives. Although it appears that several alternatives were considered, most were eliminated from detailed analysis. It appears that a few additional alternatives may be reasonable and warrant further exploration. The revised or supplemental DEIS should address the alternatives discussed below.

The DEIS does not include an alternative that addresses clean up of current groundwater and surface water at the proposed mine site. The DEIS (p. 2-58) states that the No Action Alternative

# Responses to Letter 1

1-7 In addition to the two alternatives analyzed in detail in the Phoenix Project EIS, a total of 11 alternatives were considered for evaluation but were eliminated from detailed analysis for a variety of reasons, as described in Section 2.5.2 of the EIS. These alternatives included four alternatives associated with pit lakes and backfilled pits, an alternative heap leach pad location, two alternative waste rock facility cap designs, and four alternatives for waste rock facility drainage management. The USEPA's comment suggests that additional alternatives may be reasonable and warrant further evaluation; these alternatives are addressed below.

# Letter 1 Continued

Phoenix Mine DEIS  
EPA Comments – May, 2001

1-7 would have significant adverse impacts to water and geochemistry from the development of acidic pit lakes and groundwater degradation from existing waste rock facilities. BLM indicates its preference for the Proposed Action because it "provides greater assurance that these impacts would not occur, or would be mitigated." It is unclear why and how the Proposed Action provides greater assurance regarding this mitigation than the No Action Alternative. The DEIS (p. 2-11) indicates that the requirements of the Water Pollution Control Permit and related work plans dictate how BMG would manage low quality water at the site. EPA believes that BMG/Newmont is responsible for cleaning up contaminated groundwater or surface water resulting from the existing project *independent of the proposed project*; and that a massive expansion of the project, which would degrade water quality further, is *not* justified simply because current permits do not require BMG to conduct proper closure and/or post-closure activities at the existing mine. The revised or supplemental DEIS should discuss how, under existing State and Federal regulations, BMG would be responsible for preventing acidic pit lakes and degradation of groundwater at the current mine and under the No Action Alternative, and what ability BLM or the State of Nevada has to require measures to either prevent or mitigate these impacts.

1-8 The DEIS does not adequately analyze alternatives that allow pit lakes to form and how groundwater would be affected, and how these effects would be mitigated. The revised or supplemental DEIS should evaluate alternatives that do not involve pit backfilling and thoroughly discuss in comparative form how impacts, mitigation measures, reclamation and post-closure activities would differ.

1-9 Project alternatives that could reduce impacts to resources are not analyzed in the DEIS. Such alternatives could involve elimination of certain pits from the Proposed Action, which would reduce the project's impacts on groundwater from waste rock deposited on the surface and possibly from waste rock backfilled into the pits. We recommend the revised or supplemental DEIS evaluate reduced project alternatives.

## Water Quality

1-10 The DEIS states that surface water would not be affected by the proposed project because all contaminated leachate would infiltrate into the ground or be captured at the toe of each waste rock facility. According to the DEIS (p. 3.2-12), discharges during storm events which violated water quality standards have already occurred at the project site. We do not believe the 100-year, 24-hour event controls would be adequate over the long-term, particularly in light of the expected pH and metals concentrations in water that would be released during storm events. Because controls would be needed for 1000+ years, EPA strongly recommends that BLM require installation of controls which can withstand the probable maximum flood. The revised or supplemental DEIS should address this issue.

# Responses to Letter 1

Regarding an alternative to clean up existing contaminated ground water and surface water at the mine, the BLM concurs with the USEPA that BMG is responsible for cleaning up contaminated ground or surface waters at the site, independent of the proposed project. The No Action alternative would include the clean-up of existing contaminated waters as well as reclamation of existing facilities at the Battle Mountain Complex. These regulatory requirements are included in BMG's approved State of Nevada permits for the current operations, as described in Section 2.3.1 of the EIS. Section 2.3.2 of the EIS describes the reclamation and closure requirements for the approved Reona Project and for other existing facilities in Copper Canyon. The Proposed Action is preferable, however, because it would provide a single comprehensive plan for addressing these impacts. For example, closure and reclamation of the historic waste rock and tailings facilities are incorporated into the operations included in the Proposed Action.

1-8 Regarding alternatives that would allow the formation of pit lakes, as described in Sections 2.4, 2.5.2, and 2.5.2.1 of the EIS, the Phoenix Project as originally proposed did not include the backfilling of open pits; pit lakes would have formed in the Phoenix, Fortitude, and Midas pits. Based on initial hydrologic and geochemical analyses of these pit lakes, the Proposed Action was subsequently modified to eliminate pit lakes and the associated impacts. Section 2.5.2.1 of the EIS addresses various pit lake and backfill scenarios and provides rationale for their elimination from detailed analysis.

1-9 The original project proposed in the 1994 Plan of Operations included smaller project facilities. Based on BMG's exploration results, smaller and/or shallower pits would still expose sulfide materials. In addition, a smaller (i.e., reduced) project alternative would not meet the requirements of BMG's purpose and need for the Proposed Action (see Section 1.1 of the EIS). The BLM encouraged BMG to identify their most likely overall mine plan as the Proposed Action so that the direct and cumulative impacts of all reasonably foreseeable future actions would be comprehensively evaluated in the EIS. The BLM discouraged a "piecemeal" approach to expansion of the Phoenix site.

1-10 The storm water control features for the existing site (Figures 2-2 and 2-3), the proposed project (Figure 2-4), and the long-term post-project condition (Figure 2-6) are described in the EIS and in the referenced operating plans. A storm water conveyance and retention system has been constructed on the site since the events of spring 1998. This system would be modified appropriately for the proposed project in accordance with or in excess of federal and state regulations. Post-reclamation storm water management would be designed to safely convey the peak run-off resulting from a 100-year, 24-hour storm event under normal hydrologic conditions.

Probable maximum flood (PMF) design standards are appropriate for high-hazard water resource structures where catastrophic failure would result in significant loss of life and property (e.g., homes and buildings). This is not a situation relevant to the proposed project or its alternatives, either within or in proximity to the proposed project area. Furthermore, the Proposed Action includes a comprehensive program of monitoring, reclamation, and closure procedures, which would offset the need for a PMF design level from an environmental standpoint.



# Letter 1 Continued

Phoenix Mine DEIS  
EPA Comments – May, 2001

- 1-11 The DEIS does not justify its conclusion that groundwater would not be contaminated as it moves through backfilled pits. It is unclear that waste rock backfilled into the pits would be sufficiently neutralized to prevent acid generation or mobilization of sulfates and metals in groundwater moving through the waste rock. The DEIS indicates that hydrated lime or limestone would be mixed with that portion of waste rock that would be placed below the predicted post-mining water table. However, no specifications are provided regarding application rates or mixing ratios. This information is necessary in order to discern whether the waste rock would be adequately neutralized. The amount and cost of this material, including handling and hauling from its source, are also needed. The revised or supplemental DEIS should include all this information.
- 1-12 The DEIS (p. 3.2-53) also states that the amended waste rock (below the predicted post-mining water table) would be overlain by non-amended waste rock. It appears, therefore, that there may be no additional neutralizing capacity to handle acid generated by this non-amended waste rock. If groundwater moving through backfilled pits becomes contaminated, post-closure groundwater extraction and treatment could be more costly because the dilution factor used in calculating contaminant concentrations could be over estimated. This would also appear to be the case for non-amended waste rock that is disposed in surface facilities (i.e., not pit backfills). We urge BLM to require adequate neutralization of waste rock both below and above the predicted post-mining water table and address this in the revised or supplemental DEIS. If BLM continues to propose that waste rock placed above the predicted post-mining water table not be amended, the revised or supplemental DEIS should provide geochemical modeling results that support the reasoning for this.
- 1-13 In addition, even if the waste rock were sufficiently neutralized, it appears that metals and other contaminants could still be mobilized. According to the DEIS (p. 3.2-32), some waste rock will leach contaminants such as arsenic, regardless of the pH. The revised or supplemental DEIS should thoroughly assess the potential for backfilled pits to contribute to groundwater contamination from both amended and non-amended waste rock.
- 1-14 BMG's Waste Rock Management Plan does not adequately specify procedures for analyzing waste rock in terms of net neutralizing potential to acid generating potential (NNP:AGP) in order to appropriately dispose of and neutralize waste rock and to determine whether certain material can be used for cap/growth medium. The revised or supplemental DEIS should include more detailed waste rock analysis information, including sampling volumes and frequencies, representativeness and representativeness monitoring, and identify thresholds that would trigger further testing.

# Responses to Letter 1

- 1-11 The application rates of hydrated lime or limestone to submerged sulfidic waste rock would be based on experiments and stoichiometric calculations that are documented by Exponent in Appendix B2 of the Hydrochemical Characterization Report (Exponent 2000a). The experiments identified appropriate application rates that would neutralize oxidation products. Organic amendments also may be added to the waste rock to reduce the sulfate concentration of the neutralized water. While efforts would be made to neutralize the water and reduce sulfate and metals concentrations, the Contingent Long-term Groundwater Management Plan (Brown and Caldwell 2000c) includes measures to ensure the capture and treatment of affected ground water that could potentially migrate from the pit backfill waste rock storage facilities.
- Calculations of the amounts and costs of backfill amendment materials are documented in the reclamation bond calculations in compliance with 43 CFR §3809.
- 1-12 The geochemical modeling of waste rock oxidation (Exponent 2000a) at the Phoenix Project was based on the conservative assumption that all of the sulfide present in the waste rock would oxidize. The modeled scenario did not include amendment of nonsaturated waste rock with neutralizing agents. The issue of predicted elevated ground water concentrations of sulfide and metals downgradient of the waste rock storage facilities was addressed through the development of the Contingent Long-term Groundwater Management Plan (Brown and Caldwell 2000c). The actual concentrations of sulfide and metals in ground water downgradient of the waste rock storage facilities are likely to be lower than those predicted by Exponent, and the contingent plan would include sufficient capability to handle concentrations up to those predicted by the conservative modeling.
- 1-13 The referenced section of the Draft EIS (page 3.2-32) discusses existing ground water arsenic concentrations in the project area, while the comment addresses mobilization of arsenic from waste rock. Nonetheless, the Contingent Long-term Groundwater Management Plan (Brown and Caldwell 2000c) is designed to mitigate downgradient ground water impacts. The EIS includes a detailed, conservative (i.e., high rates of constituent release) simulation of the release of constituents from amended and non-amended waste rock (pages 3.2-53 to 3.2-57, Draft EIS and Exponent 2000).
- 1-14 Section 8.1 of the Waste Rock Management Plan (Brown and Caldwell 2000d) describes the testing of waste rock that would be used to distinguish potentially acid-generating rock from neutral rock. Early testing of waste rock samples would be used to confirm a correlation between acid-base accounting (ABA) tests and net acid generation (NAG) tests that were determined during development of the Waste Rock Management Plan. The frequency of testing would be based on the variability of lithology and mineralization observed during logging of blasthole cuttings. Quarterly reports documenting the testing frequency and results would be submitted to the Nevada Division of Environmental Protection (NDEP) and the BLM, with the testing frequency adjusted as necessary to ensure adequate segregation of rock types. The minimum frequency of NAG testing for the proposed Phoenix Project is listed below. This proposed testing frequency is presented in the *Addendum to the August 2000 Phoenix Project Waste Rock Management Plan*, November 6, 2001 (Brown and Caldwell 2001). The frequency of NAG testing for each material type is greater than the minimum testing recommended in the guidelines published in the *Draft Acid Rock Drainage Technical Guide* (SRK 1989).

Waste Rock Material Types	Approximate Tonnage (1000s of tons)	Number of NAG Tests	Approximate Sample-to-Tonnage Ratio
Oxide and Marble	191.4	350	1:546,900
Sulfide and Existing Waste Rock	657.7	300	1:1,315,400
Cover Materials	38	150	1:253,000

Source: Brown and Caldwell 2001.

In addition, mitigation measure S-4 specifies additional geochemical testing of the capping material and measures to mitigate potential risks to terrestrial organisms.

# Letter 1 Continued

Phoenix Mine DEIS  
EPA Comments – May, 2001

1-15 The DEIS (p. 3.2-59) states that the proposed tailings facilities are not anticipated to have a significant impact to surface or groundwater quality because they would be designed and constructed for containment in accordance with the Nevada Administrative Code to prevent discharge. It is unclear what design and construction standards were used for the existing tailings facility, which has contaminated the groundwater with chloride, sodium and sulfate. The revised or supplemental DEIS should clearly explain the difference between the current tailings design and the proposed design, and how the same adverse effects would be avoided.

1-16 Although we understand that BLM policy indicates a NNP:AGP ratio of 3:1, the DEIS (p. 3.2-34) states that "a ratio of 1.2 is a reliable and conservative demarcation for classifying rocks as acid neutralizing versus acid generating." EPA strongly disagrees with this statement and recommends that it be deleted from the document.

## Reclamation, Closure, and Post-Closure Activities

1-17 The DEIS (p. 2-36) indicates that "oxide, benign, and/or amended waste rock or other suitable material" would be used to cap waste rock facilities. Given the high percentage of rock at the site that is acid generating, and the need for a sufficient amount of net neutralizing rock for five feet of capping material over approximately 2,670 acres of waste rock facilities and two feet of cover over approximately 1,400 acres of tailings, the source of all this net neutralizing rock is unclear. This is critical information. The DEIS (p. 3.3-12) states that 38.5 million tons of capping material would be needed to cap the proposed waste rock facilities, and BMG has identified approximately 200 million tons of capping material on the site. The DEIS also states these materials have been characterized as having an NNP equal to or greater than zero, and as not requiring neutralizing amendments to be useful for facility capping. However, the DEIS does not provide compelling evidence that sufficient capping material would actually be available. We believe BLM must reevaluate what it deems "suitable" for use as cover material for several reasons:

- 1-18 It appears from information in the DEIS that an NNP of zero, based on the percent of sulfur in the sample, does *not* adequately ensure that the rock is not acid-generating. The DEIS (p. 3.2-36) states all of the cells with positive NNP rocks remained neutral, and less than half of the negative NNP cells remained neutral over a 62-week kinetic testing period. The DEIS goes on to conclude that these "results indicate that an [NNP] of zero is an appropriate cutoff for distinguishing acid-producing rocks from acid-neutralizing and unreactive rocks." Based on the information given, EPA does not agree with this conclusion. We believe an NNP of significantly greater than zero would be appropriate for this cap/growth medium.

# Responses to Letter 1

1-15 As explained in the Draft EIS on page 3.2-32, the existing tailings facility (which is the source of the solute plume) is an unlined facility. The proposed tailings facilities would be constructed with a liner system designed to provide containment of leachate generated or delivered to the facility (Section 2.4.12 of the EIS).

1-16 The BLM policy for the State of Nevada has identified an acid-neutralizing potential (ANP):acid-generating potential (AGP) ratio of 3:1 as a threshold below which kinetic testing is needed to demonstrate that a sample is not acid-generating (BLM 1996b). Eighty-two kinetic tests were conducted on samples from the Phoenix Project site to refine the understanding of potential acid generation from these rocks. The kinetic test data demonstrated that no sample with an ANP:AGP ratio greater than 1 (or a net neutralization potential [NNP] above zero) generated acidic leachate over periods of at least 20 weeks. These tests were used as the basis for the selection of a ratio of 1 as the cutoff between potentially acid-generating and neutral rocks. The ratio of 1.2 mentioned in the Draft EIS is a cutoff that has been used by the NDEP, rather than the BLM.

1-17 The extraction schedule presented in Table 2-2 of the EIS shows the yearly amounts and locations of waste rock to be generated during the proposed Phoenix Project. Table 1 in the Waste Rock Management Plan (Brown and Caldwell 2000d) shows the same table expanded to indicate the estimated amounts of oxide waste rock, non-oxide waste rock, and marble waste rock to be generated each year. These tables are based on the comprehensive block model of lithology and geochemistry developed for the project. The extraction schedule demonstrates BMG's current understanding of the location and timing of waste rock generation. Based on the extraction schedule, sufficient non-acid generating waste rock for capping requirements will be available throughout the life of the project.

1-18 As stated in the response to comment 1-16, no sample with NNP greater than zero generated acidic leachate during at least 20 weeks of kinetic testing. A plot of kinetic test leachate pH versus NNP, which demonstrates this conclusion, is presented in Figure B1-4 of the Hydrochemical Characterization Report (Exponent 2000a).

# Letter 1 Continued

Phoenix Mine DEIS  
EPA Comments – May, 2001

- 1-19 According to pages 3.2-36 and 37, the oxide rocks to be used for cover material were tested using Nevada's Meteoric Water Mobility Procedure (MWMP), and several samples had pH values outside the drinking water standard range of 6.5 to 8.5. The average NNPs for the oxide samples taken from all the proposed pits are virtually zero. Yet only oxide samples from the Reona pit did not deviate outside of the drinking water standard for pH. However, oxide samples from this pit did exceed drinking water standards for arsenic, aluminum, fluoride, and manganese. Oxide samples from all of the proposed pits exceeded drinking water standards for at least two of the seven parameters tested (DEIS, Table 3.2-11).
- 1-20 It is unclear at this time how the cap/growth medium material would need to be amended to offset geochemical or geotechnical limitations. The revised or supplemental DEIS should include a commitment to conduct field tests to evaluate amendments for the cover material to prevent potential impacts to reclamation success from high arsenic or other contaminants, low pH, sodium adsorption ratio, texture, or other problems. Tests should be conducted early in the mine life so that the reclamation bond can be adjusted if results indicate the need for costly amendments or topsoil.
- 1-21 The revised or supplemental DEIS should identify alternate sources and costs of material or alternate methods of providing an appropriate cap/growth medium should pilot tests determine adequate cap/growth medium would not be available. It is unclear from the DEIS whether material from the borrow area would be considered for this purpose. If it is, the revised or supplemental DEIS should thoroughly describe the geochemical and geotechnical properties of this material, including any ecological risk factors and whether it would need to be blended with other material, and discuss how it would be handled and applied.
- 1-22 The revised or supplemental DEIS should also indicate where and when during the mining sequence the suitable cover material would be excavated, and whether sufficient quantities would be available when needed for concurrent reclamation. If not, the document should provide a plan to address the shortfalls.
- 1-23 In order to ensure that there would be an adequate amount of suitable net neutralizing rock for cap and growth medium material, the revised or supplemental DEIS should identify specific sources and tonnages of NNP rock at the proposed mine.
- 1-24 The DEIS (p. 2-43) states that five feet of cap material would minimize infiltration of meteoric water into the waste rock; however, this conclusion is not justified in the DEIS. It appears that most of the precipitation occurs during months when evapotranspiration is expected to be relatively low. However, there is no information in the DEIS regarding average monthly

# Responses to Letter 1

- 1-19 The comment points out that the maximum concentrations of many constituents in meteoric water mobility procedure (MWMP) leachate exceeded drinking water standards in many areas; the average concentrations would be lower than the maxima. In recognition of the potential for elevated concentrations of some constituents in surface soils to affect plant growth, mitigation measures S-4 (Section 3.3.4) and V-1 (Section 3.4.4) in the Final EIS were developed to ensure the establishment and sustainability of vegetated covers on the waste rock facilities.
- 1-20 BMG proposes to conduct concurrent reclamation activities throughout the mine life. In accordance with mitigation measures S-4 (Section 3.3.4) and V-1 (Section 3.4.4) in the Final EIS, BMG would be required to conduct geochemical testing, monitoring for chemical uptake and accumulation, and assessment of the risk to reclamation success and wildlife and livestock. If these evaluations identify a potential risk, then the Waste Rock Management Plan would be modified to exclude cap materials with elevated metals concentrations or other measures would be identified (as outlined in measures S-4 and V-1) to mitigate potential adverse impacts.
- 1-21 Alluvial borrow materials would be considered if additional cap/growth media were needed. These alluvial materials occur in Buffalo Valley adjacent to the existing heap leach and tailings facilities and in the South Optional Use Area. These materials likely represent eroded portions of oxidized bedrock materials that have been extensively characterized by Exponent, and thus would be suitable for use in cap construction or other uses (Exponent 2000a). Prior to incorporating alluvial borrow materials into any facility cap, BMG would be required to further characterize the geochemical and geotechnical properties of these materials to demonstrate that their use would support proposed closure and reclamation goals and would not adversely affect human health or the environment.
- 1-22 As indicated in the response to comment 1-17, the expanded extraction schedule presented in Table 1 of the Waste Rock Management Plan (Brown and Caldwell 2000d) shows that sufficient oxide waste rock would be available at the appropriate times for placement as cover material on the waste rock facilities.
- 1-23 Please see the responses to comments 1-17 and 1-22.
- 1-24 Climatological data required for the infiltration modeling included daily maximum and minimum temperatures, precipitation, solar radiation, and wind speed. Data collected at climate stations at the Battle Mountain Airport and at Copper Canyon (and other climate data stations in the region) served as the basis for generating a synthetic climate record for the long-term modeling. Details regarding the methodology used to determine the appropriate climate data for use in the infiltration modeling are provided in Section 5 and Appendix A7 of the Hydrochemical Characterization Report (Exponent 2000a).

As detailed in Section 5 of the Hydrochemical Characterization Report (Exponent 2000a), the water balance in the proposed waste rock cap is sensitive to transpiration. The vegetation types and rooting depths were evaluated based on: (1) vegetation and rooting depths observed at the nearby Copper Basin reclamation area located a few miles north of the proposed Phoenix Project, and (2) literature research. The results of these studies were used to estimate the most likely vegetation types (and their rooting depths) that would be established in the long term. The results of this evaluation concluded that the rooting depth (evaporative zone) assumed in the HELP model was a realistic estimate of the anticipated long-term rooting characteristics.

# Letter 1 Continued

Phoenix Mine DEIS  
EPA Comments – May, 2001

- 1-24 evapotranspiration rates or growing seasons for plants to be used to revegetate the site. An underestimation of infiltration rates could result in inadequate post-closure funds to pump and treat the contaminated groundwater. The revised or supplemental DEIS should provide information regarding monthly average evapotranspiration rates and growing seasons for plants to be used in reclamation, and include the modeling that was conducted to justify BLM's conclusion that the cap would significantly reduce infiltration of meteoric water into the waste rock facilities.
- 1-25 If revegetation is unsuccessful, grazing or other activities on reclaimed waste rock facilities, heap leach pad, and tailings could result in erosion, rilling and gullyng on these features. Such disturbance could expose acid generating material and exacerbate the potential for contaminated surface runoff. The revised or supplemental DEIS should discuss the potential long-term problems associated with the reclaimed surfaces and specify any necessary restrictions, such as grazing and off-highway vehicle exclusions. The document should also estimate perpetual maintenance costs such as exclusion fencing, regrading, revegetating after erosion and fires, etc.
- 1-26 There are several springs in the headwaters of Butte and Iron Creeks that would be buried by the Butte Canyon, Iron Canyon North, and Iron Canyon South Waste Rock piles. The DEIS states that seepage and runoff from these canyons would be treated until final closure and mitigation measures have been implemented. Since these seeps may continue to flow on the surface, regardless of surface closure measures, the revised or supplemental DEIS should discuss provisions in the Plan of Operation and Contingent Long-term Groundwater Management Plan that ensure capture and treatment of these surface flows after final closure and mitigation measures are completed. The discussion should include what would happen if the springs temporarily disappear due to dewatering of the Phoenix pit and reappear in the future when the groundwater rebounds.
- 1-27 According to the DEIS (p. 3.2-86), the time frame for continued monitoring of the waste rock facilities during post-closure is not specified in the Waste Rock Management Plan or Contingent Long-Term Groundwater Management Plan. Furthermore, the DEIS states on page 3.2-87 that Nevada Division of Environmental Protection could require monitoring for up to, but not exceeding, 30 years after permanent closure of a facility. Groundwater contamination already exists, and the BLM should require that existing facility monitoring be guaranteed up to and beyond 30 years after closure to ensure there would be no gap in monitoring. BMG should commit to monitoring as long as there is a potential to contaminate groundwater or surface water for the 1000+ years during which they would conduct perpetual treatment.
- 1-28 A number of options are available for managing drain down water from the tailings ponds, including infiltration and treatment (DEIS, p. 2-44). The revised or supplemental DEIS should identify the expected volumes of drain down and the respective costs for each method of

# Responses to Letter 1

- 1-25 As discussed in Section 3.3.2.1 of the EIS, Golder Associates (2000b) investigated the surficial erosional stability of the proposed reclaimed facilities, particularly the waste rock facilities; soil erosion losses were estimated to be low (i.e., approximately 0.2 ton per acre per year). Also as discussed in Section 3.3.2.1 of the EIS, no rilling or gullyng was observed on reclaimed areas in Copper Basin, for which the reclamation materials and facility configurations are similar to the Proposed Action. Mitigation measure S-2 in Section 3.3.4 of the EIS requires development of a grazing management plan for the project area. The purpose of this plan is to ensure that grazing does not adversely affect the successful reclamation of the project area, including the integrity of the waste rock facility caps. As discussed in mitigation measure S-2, the grazing management plan would address the fiscal responsibility for implementing the plan.
- 1-26 As explained in the EIS (Section 3.2.2.1, Proposed Action, Storm Water Management), the Phoenix Project Storm Water Pollution Prevention Plan (Brown and Caldwell 2000g) includes measures for the collection, monitoring and treatment (if necessary), and/or reuse of surface water that comes in contact with waste rock material. Proposed procedures to monitor runoff water quality from waste rock facilities are outlined in mitigation measure WR-11 (Final EIS, Section 3.2.4). Surface water monitoring would be performed throughout the operation and closure of the mine. After the waste rock facilities have been capped and revegetated, surface runoff or seepage that is acidic and/or contains excessive metals concentrations is not expected to occur. The placement and capping of the proposed waste rock facilities is also predicted to reduce recharge and result in a residual cone of depression beneath the waste rock facilities (see Figure 3.2-16 in the EIS). The residual cone of drawdown is not predicted to rebound in the foreseeable future. There are no identified springs or seeps with perennial flow located within the footprint of the waste rock facilities. The permanent reduction of recharge, and lowering of the ground water elevations by an estimated 200 feet in the vicinity of this spring, is expected to dry up the spring. As stated in the EIS, for the reasons identified above, flow impacts to springs and seeps located within the residual drawdown cone are not expected to recover in the long term.
- 1-27 For the Proposed Action, mitigation measures WR-5 and WR-6 (Section 3.2.4, Monitoring and Mitigation Measures) provide for long-term, postclosure, unsaturated zone monitoring within the waste rock facilities, and ground water monitoring immediately downgradient of the waste rock facilities. As stated in WR-6, this monitoring would continue until the potential risk of ground water contamination has been shown to be minimal as determined by the BLM in coordination with other applicable agencies. For currently permitted facilities, BMG would continue to monitor and mitigate existing impacts under its current Water Pollution Control Permit administered by the State of Nevada.
- 1-28 Reclamation and fluid management options, including estimated draindown volumes, and a bond cost estimate have been submitted to the BLM and NDEP with the Phoenix Project Plan of Operations. The Plan of Operations references tailings draindown management in Section 6.H and presents costs for management of both tailings and heap draindown in Appendix B on Sheet 37 of the reclamation cost estimate. These costs are based on the use of forced evaporation equipment to dispose of draindown water. No neutralization or treatment of the water is necessary since no water would be discharged to surface water or ground water resources. The final closure plan will contain a more refined estimate of draindown solution volumes and water quality than is available prior to facility construction and operation.



# Letter 1 Continued

Phoenix Mine DEIS  
EPA Comments – May, 2001

- 1-28 treatment. Cost estimates should include neutralization before infiltration because the tailings would be acidic.
- 1-29 The revised or supplemental DEIS should estimate the volume of lime sludge that would be generated over more than 1000 years from the water treatment facility and identify how the sludge would be handled and disposed. The document should also describe the design and costs of sludge handling facilities.
- 1-30 The DEIS (p. 3.2-62) states that after reclamation and revegetation have been deemed successful and the site has been stabilized, the long-term storm water control structures would gradually fail. It would be unacceptable to let the stormwater control structures fail after reclamation without cleaning out the structures because the structures function to drop out contaminated sediment, not just control water surges. Therefore, the revised or supplemental DEIS should clarify how storm water control structures would be properly reclaimed.
- 1-31 DEIS Figure 2-5 should include the location of the treatment facility that would be needed for between 30 and 1000+ years.

## Air Quality

### Hazardous Air Pollutants

- 1-32 The DEIS does not provide estimated emissions of hazardous air pollutants (HAPs) from the proposed or existing project. The revised or supplemental DEIS should identify all HAPs and sources of HAPs at the mine, and discuss how all HAPs would be controlled to reduce their emissions as much as possible.
- 1-33 Mercury is a persistent bioaccumulative toxic substance that has been receiving increased attention over the past three years. EPA is becoming increasingly concerned about even small releases of mercury to the atmosphere. Pristine lakes in Wisconsin and remote areas of the Florida Everglades are finding mercury levels in fish above Federal standards for fish consumption. EPA's 1997 *Mercury Study Report to Congress; Volume 3, Fate and Transport of Mercury in the Environment* indicates this mercury is from atmospheric deposition from mercury emissions that are thousands of miles away. EPA now considers mercury air emissions over ten pounds as a significant enough concern that, beginning last year, such emissions must be reported by a mining company in its annual Toxic Release Inventory submitted to EPA.
- Recent 1999 Toxic Release Inventory information submitted by Nevada gold heap leach mining companies has revealed that these mines can be significant sources of mercury point source air emissions from autoclaves, roasters, stripping units, electrowinning units, retorts, refining

# Responses to Letter 1

- 1-29 Section 5.5 of the Contingent Long-term Groundwater Management Plan (Brown and Caldwell 2000c) describes the management and disposal of sludge from the water treatment plant. The costs of sludge management are included in the financial assurance package and cost estimate for implementing the Contingent Long-term Groundwater Management Plan.
- 1-30 An additional mitigation measure WR-9 has been added to Section 3.2.4 in the Final EIS to stipulate that as part of final reclamation and closure, sediment contained in the basins would be sampled and geochemically tested to determine if the sediments contain contaminants likely to degrade surface or ground water. If the sediments contain contaminants likely to degrade surface or ground water, the sediments would be excavated and disposed of either on- or off-site in accordance with applicable state and federal regulations.
- 1-31 In response to this comment, the locations of the water treatment facility and sludge disposal area have been added to Figure 2-5 in the Final EIS.
- 1-32 The Phoenix Project would emit only small quantities of hazardous air pollutants (HAPs) and would release relatively few of the substances listed as HAPs under Title III of the Clean Air Act Amendments of 1990. Potential Phoenix Project emissions of individual and combined HAPs are less than the regulatory limits that require specific permitting and/or application of specific control technologies.
- HAP metals (antimony, arsenic, beryllium, cadmium, chromium, cobalt, lead, manganese, and mercury compounds) would be emitted in small quantities through handling of ore and waste rock and as components of fugitive dust from project roads and other sources. Calculated potential emissions from all project sources total a maximum of less than 2.1 tons per year (total of all metal compounds). These HAP emissions would be minimized by operational practices and controls embodied in the Phoenix Project Fugitive Dust Control Plan (Battle Mountain Gold Company 2000b).
- Other potential HAP substances would be emitted by project diesel engines. Total potential HAP substance emissions from the combustion of diesel fuel are calculated to be 0.8 ton per year.
- Cyanide compounds (principally very low concentrations of hydrogen cyanide) would be emitted as fugitives from the heaps, the tailings impoundments, and several gold plant processes. However, levels of hydrogen cyanide concentrations measured in the ambient air immediately above the heaps at other mines are extremely low to non-detectable. The Phoenix Project contains several techniques designed to minimize these potential fugitive hydrogen cyanide emissions, including the INCO cyanide destruct system for the tailings, heap leach solutions stored in tanks instead of open ponds, and leach solution drip emitters.

# Letter 1 Continued

Phoenix Mine DEIS  
EPA Comments – May, 2001

furnaces, and carbon regeneration kilns. One facility reported a total of over 9,400 pounds of mercury air emissions last year.

EPA has not yet developed mercury emission standards for mines, so there are no air permit limitations at present. However, it is important for a NEPA document for a heap leach gold mining operation to disclose potentially harmful air emissions whether they are regulated or not. Given the current levels of concern about mercury emissions to the atmosphere, it is important that the revised or supplemental DEIS and future gold heap leach facility EISs contain a much more complete description of the existing and future sources of mercury emissions to the atmosphere. The following changes should be made to the revised or supplemental DEIS:

- If an autoclave, roaster, or retorts would be present on site, Figure 2-6 should include them.
- Section 3.9, "Air Quality" should be expanded to include a table showing the annual HAPs emissions, as well as a table showing mercury emissions from each processing unit that has mercury. This section should also describe any equipment to condense mercury or treat and capture mercury before it is emitted. It should also note how any condensed or captured mercury is recycled, sold, or disposed.
- Section 3.9 "Air Quality" should discuss in general terms national studies showing that atmospheric deposition of mercury is of environmental concern and describe the likely fate and transport of mercury air emissions from the Phoenix Mine. This discussion need not be in great detail or based on site specific modeling studies, but merely acknowledge what is known nationally about the problems of atmospheric deposition of mercury and how it is affecting this country's water bodies. A sub-section should be added to specifically quantify existing and future mercury emissions to air.

The revised or supplemental DEIS should include the above information so that decision makers are able to know existing and future impacts of mercury emissions from this facility. The absence of air emission permit standards for mercury does not preclude the need to inform decision makers and the public about the quantity and fate of mercury emitted from this facility. Having such information in hand may assist the BLM in determining whether mitigation measures for air mercury emissions should be required of this facility.

For instance, if other mining companies in Nevada have pollution control equipment on unit processes not included at the Phoenix Mine, BLM could ask that such equipment be installed at the Phoenix Mine in order to reduce or mitigate potential adverse environmental impacts from mercury emissions. Pollution prevention opportunities should also be explored pursuant to the Pollution Prevention Act of 1990. Pollution prevention opportunities may include processes

# Responses to Letter 1

- 1-33 Mercury is a HAP that is of particular concern because it is a persistent bioaccumulative substance that may be deposited to water bodies and result in significant concentrations in fish. However, the Phoenix Project ore process does not include autoclaves, roasters, or retorts, which are the typical major sources of mercury emissions from mining operations.

The concentration of mercury in the Phoenix Project ores and waste rock is very low (less than 1 part per million). Thus, the Phoenix Project ore does not require any special processing to remove mercury or collect mercury emissions. Nor is any mercury added to the Phoenix Project ore process. Because the ore and waste rock contain so little mercury, the emission of mercury compounds (principally mercury sulfide and mercury oxide) as fugitive dust (total suspended particulate) from the project roads and other sources has been calculated at only 4 pounds per year, none of which would be elemental mercury. Because there is so little mercury in the ore, any mercury emissions from the gold plant (stripping units, electrowinning units, furnaces, and carbon regeneration kilns) also would be extremely small.

1-33



# Letter 1 Continued

Phoenix Mine DEIS  
EPA Comments – May, 2001

- 1-33 such as adding chemicals to the barren leach solution that will selectively keep mercury in the heap leach pile while allowing gold to leach out.

## Criteria Pollutants

The DEIS provides estimates of anticipated air emissions by the proposed project. However, it does not indicate how much of the Prevention of Significant Deterioration (PSD) ambient air increment would be consumed by the proposed project. In order to conform with State/federal laws and regulations, the project cannot violate PSD increments. Once the minor source baseline date has been triggered for a certain pollutant in a specified area, all emissions from minor sources of that pollutant consume increment. PSD increments exist for sulfur dioxide, PM10 (particulates smaller than 10 microns in diameter), and nitrogen dioxide. Furthermore, PSD increments are highly protective of air quality in Class I areas such as wildernesses and national parks. The Class I and Class II PSD increments are provided in the table below. The revised or supplemental DEIS should indicate whether the minor source baseline date for this area has been triggered for these pollutants and, if so, discuss how much PSD increment would be consumed by the proposed project's air emissions. Potential impacts to Class I PSD areas, including visibility impacts, should also be discussed. We recommend that BLM consult with the Nevada Division of Environmental Protection regarding these issues.

1-34

PSD INCREMENTS: Class I areas		PSD INCREMENTS: Class II areas	
PM10 annual	4 $\mu\text{g}/\text{m}^3$	PM10 annual	17 $\mu\text{g}/\text{m}^3$
PM10 24-hour	8 $\mu\text{g}/\text{m}^3$	PM10 24-hour	30 $\mu\text{g}/\text{m}^3$
NO <sub>2</sub> annual	2.5 $\mu\text{g}/\text{m}^3$	NO <sub>2</sub> annual	25 $\mu\text{g}/\text{m}^3$
SO <sub>2</sub> annual	2 $\mu\text{g}/\text{m}^3$	SO <sub>2</sub> annual	20 $\mu\text{g}/\text{m}^3$
SO <sub>2</sub> 24-hour	5 $\mu\text{g}/\text{m}^3$	SO <sub>2</sub> 24-hour	91 $\mu\text{g}/\text{m}^3$
SO <sub>2</sub> 3-hour	25 $\mu\text{g}/\text{m}^3$	SO <sub>2</sub> 3-hour	512 $\mu\text{g}/\text{m}^3$

## Ecological Risk Assessment

According to the DEIS (p. 3.3-18), the proposed cap/growth medium could pose ecological risks to wildlife and vegetation. Preliminary screening evaluations indicate a potential risk to soil invertebrates and subsequently to the organisms that consume those invertebrates (e.g., the robin). High arsenic concentrations in the cap/growth medium would also likely inhibit plant growth on the reclaimed site, thus limiting vegetation and available forage.

1-35

# Responses to Letter 1

- 1-34 As stated in Section 3.9 of the Phoenix Project EIS, the only regional source that has triggered Prevention of Significant Deterioration (PSD) is the Valmy Generating Plant, located 25.3 miles north of the Phoenix Project. Information provided to the BLM by the NDEP (communication from Greg Remer, NDEP, Bureau of Air Quality to Scott Archer, BLM, July 13, 2000) indicates that the Valmy PSD application triggered the minor source baseline for particulate matter with an aerodynamic diameter of 10 microns or less (PM<sub>10</sub>) and sulfur dioxide (SO<sub>2</sub>) in the Clovers Area (Hydrographic Basin 64). Based on discussions with NDEP and other available information (including the NDEP Bureau of Air Quality issued Class II permit), the minor source baseline date has not been triggered in the Phoenix Project area (Hydrographic Basins 59 and 131), and Phoenix Project impacts do not consume increment within the area.

Air quality modeling of Phoenix Project impacts (Environmental Management Associates 1999a) showed that the project would have no significant SO<sub>2</sub> impacts within the Valmy baseline area. Total PM<sub>10</sub> impacts of the Phoenix Project and all modeled regional emission sources would be less than approximately 10 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) (highest 24-hour average) within the baseline area. This total concentration (not all of which consumes increment) is much less than the allowable 30  $\mu\text{g}/\text{m}^3$  PSD increment. Therefore, the Phoenix Project would not result in appreciable consumption of PSD increment within the nearest baseline area.

Potential impacts to the nearest Class I PSD area (Jarbridge Wilderness) are shown in Table 3.9-9 of the EIS. These modeled impacts are far below applicable PSD Class I increments and would have no discernable visibility impact.

- 1-35 The BLM agrees. The ecological risk assessment process is iterative; findings from one phase are considered in the development and implementation of subsequent phases. If a screening-level risk assessment suggests that receptor organisms or ecosystems may be at risk from a given activity, then a subsequent assessment is indicated. This second, or Tier II, assessment is more site-specific and considers pertinent data on receptor organisms, ranges, food sources, ecological habits, etc. to a greater degree than in the screening process. For example, the screening-level risk assessment often considers general organisms that may be found in the project area but that also may act as surrogate species for resident organisms. Subsequent assessments, however, consider species that are found in the project area or are critical representatives of the ecosystem, based on available data.

As indicated in the comment, the specific chemical composition of the cap material, potential plant growth success, the associated ecological risk, and appropriate mitigation measures, if necessary, cannot be precisely determined at this time. To determine revegetation success, test plots are planned during concurrent reclamation (see Section 2.4.21.4 of the EIS). Site-specific data would be gathered from these test plots on plant growth, chemical composition of the soil matrix, and plant tissue concentrations. These site-specific empirical data would be used in a site-specific risk assessment.

The ecological risk assessment conducted for the EIS was a screening-level risk assessment designed to determine if there is a likelihood of potential adverse effects to receptor organisms. As stated in the EIS, the preliminary risk assessment suggested that some adverse effects may occur to some wildlife and to some plants. As a response to this finding, a site-specific risk assessment would be conducted as stated in mitigation measure S-4 in Section 3.3.4 of the EIS. The text of mitigation measure S-4 has been expanded in the Final EIS to summarize the risk assessment process.

# Letter 1 Continued

Phoenix Mine DEIS  
EPA Comments – May, 2001

- 1-35 The ecological risk screening conducted for the DEIS appears to be conservative. However, it is clear that the chemistry of the final cover is unknown at this time. Whole rock analysis for metals is only the roughest approximation of what the final cover will contain in the way of bioavailable metals. The risk assessment and other geochemical analyses conducted for the proposed project indicate that unamended waste rock would probably be unsatisfactory for use as cap/growth medium. The metals analysis of the whole rock shows potential risk to the American robin, bighorn sheep, mule deer, elk, and domestic sheep. In a normal risk assessment scenario, this would advance the risk assessment to site-specific data gathering to determine the actual risk on site. This should be done during the project when BMG conducts pilot tests on the cap/growth medium to determine material-specific properties and needs for reclamation success. EPA believes it is imperative that BMG commit to performing site-specific ecological risk assessments on pilot test plots over the course of the mine life to ensure that the cap/growth medium is properly amended to prevent ecological risks. The revised or supplemental DEIS should include a commitment by BMG to conduct field tests to determine the appropriate mix of materials/amendments to prevent ecological risks while promoting successful reclamation.
- 1-36 Furthermore, monitoring/mitigation measures V-1 and S-4 involve monitoring and plan development, but do not include specific commitments regarding how BMG would prevent metals in the growth medium from exceeding ecological risk thresholds. The revised or supplemental DEIS should identify and describe possible mitigation measures so that the nature and potential costs of such measures are adequately assessed and deemed practical *before* the project is approved. The discussion should address whether the potential risks would increase over time and would, therefore, require additional funds in the long-term. BMG should be bonded for the possibility that the proposed cap/growth medium and amendments could be deemed unsatisfactory and that soil would need to be brought in to support vegetation that would not poison the food chain. We recommend that the reclamation cost estimate factor in the cost of a six-inch layer of topsoil over the waste rock and tailings facilities.
- 1-37 We are unfamiliar with the BLM document, *Risk Management Criteria for Metals at BLM Mining Sites*, and cannot judge the criteria used. However, it appears that the BLM criteria also use EPA's draft Eco Soil Screen Levels, which is premature. These values have not yet been peer-reviewed. The rest of the criteria used are suitably conservative for a screening.
- 1-38 It is unclear why the whole rock analysis (Table 3.3-8) did not include selenium. The revised or supplemental DEIS should address the potential ecological risks posed by this element in the cap/growth medium.

# Responses to Letter 1

- 1-36 Please see the response to comment 1-35. As described above, specific mitigation requirements would be determined based on the results of the site-specific ecological risk assessment. Possible measures are identified in mitigation measure S-4, item 4.
- The last portion of this comment indicates that bonding should occur for a 6-inch layer of topsoil over the waste rock and tailings facilities to "support vegetation that would not poison the food chain." Based on site-specific data, which have demonstrated that waste material provides adequate vegetation growth, a 6-inch lift of topsoil is not considered necessary. Furthermore, this practice would require collection of such material from a borrow area, thereby increasing the amount of disturbed area. A thin layer of topsoil would aid the germination of seeded vegetation, but it would not mitigate a potential ecological risk from metals uptake; potential toxicity associated with plant uptake would be determined and addressed in a site-specific ecological risk assessment, as discussed in the response to comment 1-35. Reclamation costs are included in BMG's reclamation bond. That reclamation bond may be adjusted, as necessary, based on test plot monitoring information. Please also see the response to comment 1-39.
- 1-37 Relative to the USEPA's ecological soil screening criteria, during the screening-level phase of a risk assessment, it is often appropriate to use available data relative to threshold effects levels, even if those data have not been subject to a structured peer-review process. Since the BLM is the lead agency for this EIS, it is appropriate to use the BLM's risk management criteria to evaluate the data. Finally, several sets of values were used to establish a weight-of-evidence approach for this screening-level risk assessment.
- 1-38 The BLM wildlife and livestock risk management criteria shown in Table 3.3-8 do not include a value for selenium; therefore, it could not be included in this comparison. However, selenium was evaluated in the comparisons using soil concentration benchmarks (Table 3.3-9) and benchmarks for soil invertebrates and plants (Table 3.3-10).

# Letter 1 Continued

Phoenix Mine DEIS  
EPA Comments – May, 2001

## Biological Resources

1-39

Pit dewatering during the proposed project would result in a reduction of flows in a perennial reach of lower Willow Creek and ten perennial springs (DEIS, p. 3.2-48), which could adversely affect springsnails and resident trout populations. The DEIS indicates that these would be significant impacts. The DEIS also states that BMG would be responsible for preparing and implementing a mitigation plan to enhance or replace the affected water sources. BLM should ensure that funds would be available for plan preparation and implementation of these measures, as well as for other measures that may be needed to mitigate other water quantity impacts (e.g., water rights). The need for mitigation may extend into the post-closure phase of the project.

1-40

Mitigation measure W-8 states that springsnail specimens would be collected in potentially affected areas and identified to species by a springsnail expert to determine if the populations represent unique species. This determination should be made now, before dewatering affects spring flows, so that any necessary special mitigation measures can be determined and adequately covered by the bond. We recommend that the revised or supplemental DEIS include this information.

## Consultation with Tribes

1-41

It appears that BLM has consulted with several tribes with potential interests in the vicinity of the mine pursuant to Executive Order 13175, "Consultation and Coordination with Indian Tribal Governments." The Battle Mountain Band of Te-Moak Tribe of Western Shoshone has expressed to EPA that it has continuing concerns regarding the proposed project's potential adverse impacts on water resources, some of which are addressed in our comments above. For your convenience, we have attached the tribe's letter. We encourage BLM to continue working closely with interested tribes on this project to resolve outstanding issues.

## Environmental Justice

1-42

The DEIS does not address environmental justice. In keeping with Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (EO 12898), the revised or supplemental DEIS should describe the measures taken by the BLM to: 1) fully analyze the environmental effects of the proposed federal action on minority communities and low-income populations, and 2) present opportunities for affected communities to provide input into the NEPA process. The document should state whether the analysis meets requirements of your agency's environmental justice strategy.

# Responses to Letter 1

1-39 As required by BLM's 3809 regulations, BMG will be required to post a financial guarantee sufficient to cover the full cost of reclamation. Using conservative assumptions, the EIS analysis has determined that pit dewatering potentially could affect flows of perennial streams and springs. However, monitoring and multi-year analyses will be required to determine if and when such an impact would actually occur and the location and size of the impact. If such an impact should occur, appropriate mitigating measures will be developed, the plan of operations will be amended to include the new operating requirements, and the financial guarantee will be adjusted accordingly. Please see mitigation measures WR-1 and WR-3 in the Final EIS. In addition, BMG will be required to establish the Phoenix Project Long-term Contingency Fund (Battle Mountain Gold Company 2001) to ensure that sufficient financial resources are available to implement the Phoenix Project Contingent Long-term Groundwater Management Plan (Brown and Caldwell 2000c). The purpose of the Phoenix Project Long-term Contingency Fund (Battle Mountain Gold Company 2001) is to address postclosure monitoring and possible mitigation activities.

1-40 The text of mitigation measure W-8 in Section 3.5.4 of the Final EIS has been revised to indicate springsnail surveys would be required prior to dewatering. Please see the response to comment 1-39 regarding bonding.

1-41 Comment noted. Please see the response to comments 1-43 through 1-46 in the letter from Bernice Lalo.

1-42 As analysis of environmental justice issues was included in Section 3.12.2.3 of the Draft EIS. The analysis in the EIS meets the BLM's environmental justice requirements.

# Letter 1 Continued

## SUMMARY OF EPA RATING DEFINITIONS

This rating system was developed as a means to summarize EPA's level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the EIS.

### ENVIRONMENTAL IMPACT OF THE ACTION

#### *"LO" (Lack of Objections)*

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

#### *"EC" (Environmental Concerns)*

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

#### *"EO" (Environmental Objections)*

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

#### *"EU" (Environmentally Unsatisfactory)*

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

### ADEQUACY OF THE IMPACT STATEMENT

#### *Category 1" (Adequate)*

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

#### *"Category 2" (Insufficient Information)*

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

#### *"Category 3" (Inadequate)*

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

\*From EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

# Letter 1 Continued

4/24/01 2:13 PM

TO: GREG PHILLIPS,  
FROM: Bernice Lalo, Tribal Environmental Coordinator  
Subject: Phoenix Project

You asked if we had concerns, yes, we do.

1-43 First of all, there is contamination from prior mining. This is an unlined tailings pond. They are proposing to create a new tailings pond on top of this. There will still be seepage if they follow through with their plan. There is still the potential to affect the environment with contaminated water. They may plan to install a strong lining but how long into the future will this "strong" lining last?

1-44 Second, the most important thing in the desert is water. The project will enlarge the existing pit, already under water level. When this is enlarged, more acidic and toxic surfaces will be exposed with the potential to contaminate water. These exposures from the surrounding mountainside will further degrade the water. When the mines have abandoned this project, this pit will fill and therein lies the greatest potential for more contaminated water.

1-45 There are some mountain springs located nearby, this project has the reality to affect the flows of these mountain springs. The cumulative effects will not only affect this particular site but the cumulative impacts will be far and wide as the whole mountain range is currently being mined. Because these permits are written project by project, the cumulative impact is not taken into consideration. This is not an isolated project; it is a project destined to follow the mountain range, project by project. Water fit to drink for humans and for animals and plants will be scarce! This is the desert and the undersurface water bodies will all be affected.

1-46 Lastly and most significantly, as we have reiterated time and again, these are the homelands and aboriginal territories of the Western Shoshone. We have a kinship with the land and the destruction of the land by draining and polluting the waters, especially the springs, are steps we consider genocide for the traditional Western Shoshone people. The effects of dewatering will be devastating to the Western Shoshone who have lived in these areas for centuries, upon centuries. These mountain ranges are where we hunted, prayed and existed. We have practiced our religion on these lands, and the springs and other bodies of water are part of this religion. We have not relinquished our practices upon the coming of the White Man. The churches of the Newe (We call ourselves people) are not grounded to a certain place. We find it very difficult to pinpoint these areas out to Federal agencies, such as BLM, because the confidentiality and respect issues are not treated as such. Because our beliefs are connected with the well being of the earth, we have no choice but to protest these genocidal issues. To sever, destroy or alter, is akin to our destruction, as well.

# Responses to Letter 1

1-43 As explained in Section 2.3.1 of the EIS, the chloride plume associated with the unlined Gold Tailings Facility is currently being mitigated in accordance with plans submitted and approved by the NDEP under the requirements of the Water Pollution Control Permit. These plans include long-term ground water extraction to contain the plume and reduce the levels of total dissolved solids in the ground water. In addition to ground water extraction, construction of the proposed lined tailings facilities (i.e., Tailings Area 1 and Tailings Area 3) would serve as a cap over the existing unlined tailings and would reduce seepage through the older tailings materials (Golder 1999d). The proposed tailings facilities would be constructed with liner systems consisting of a 60-mil linear low density polyethylene (LLDPE) synthetic geomembrane liner; LLDPE liners are used throughout the world in similar applications. Liner manufacturers have conducted accelerated exposure testing to estimate longevity with respect to buried applications. These tests demonstrate that liner lifetimes are extremely long (typically on the order of several hundreds of years) in buried applications. During reclamation, the tailings would be capped and revegetated to promote evapotranspiration and minimize infiltration. The facility design and reclamation should control or minimize seepage out of the facility. For these reasons, the tailings facilities are not expected to affect ground water quality.

1-44 The potential impacts to water resources associated with the open pits included in the Proposed Action are addressed in Section 3.2.2.1 of the EIS. The last sentence of the comment implies that the pits would fill with water after mine closure. As explained in the EIS, under the Proposed Action all of the open pits that extend below the water table would be completely or partially backfilled to preclude pit lake development; therefore, no impacts associated with pit lake development are anticipated.

1-45 The potential cumulative impacts to water resources are discussed in Section 3.2.3 of the EIS. In response to this comment, the cumulative impact section in the Final EIS has been revised to include a summary of the potential cumulative impacts to springs in the Battle Mountain range resulting from existing and proposed mining activities.

1-46 Data collected on Native American concerns for the Phoenix Project identified general concerns such as the effects on water, vegetation, and wildlife; however, no specific areas of concern were identified. These concerns are noted in the discussion of Native American concerns in Section 3.8 of the EIS. Effects on water, vegetation, and wildlife also are addressed in the EIS in Sections 3.2, 3.4, and 3.5, respectively. Unlike some other historic mining districts, Native Americans do not appear to have historically occupied the Battle Mountain Mining District.



## Letter 1 Continued

When the waters of the United States are impacted, the general population will be also impacted. When the waters are lessened or dried up, the "churches" of the Western Shoshone will no longer be available for worship places as these are some of our "churches." For the mainstream European-Americans, the churches are built out of wood, and sometimes, mortar—ours are built out of the landscape. These stories, part of our oral histories, are connected to the mountains.

When dewatering is used, water is lessened and mines are allowed to waste millions of gallons in one day. We are saddened but we must document these careless and irresponsible acts of contamination of water reaching into the future. The dewatering used in the mines affects ground water and, for us, is comparable to taking another step towards genocide for the Western Shoshone people. Of course, we are aware that *some* Federal agencies feel this is "insignificant" but, for us, this is of the utmost significance!

The mountains are literally coming down around us. Instead of the "*purple mountains majesties*" sung about in the *America, the Beautiful*, we are having to look at rounded humps, the mines call "successful reclamation."